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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,806	07/30/2003	Miwa Kozawa	030923	9494

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EXAMINER	
LEE, SIN J	

ART UNIT	PAPER NUMBER
1752	

DATE MAILED: 06/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

CP

Office Action Summary	Application No.	Applicant(s)	
	10/629,806	KOZAWA ET AL.	
	Examiner	Art Unit	
	Sin J. Lee	1752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 14-21* is/are rejected.

7)☒ Claim(s) *13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/26/04 & 11/18/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear whether present claim 16 is drawn to a resist pattern thickening material or a process of using the material. For the purpose of examining claim 16 on the merit, the Examiner interpreted claim 16 to be claiming a resist pattern comprising a resist pattern thickening material which comprises a resin, a crosslinking agent, and a nitrogen-containing compound, wherein the resist pattern thickening material is capable of being applied onto the resist pattern to be thickened (after forming the resist pattern to be thickened) so as to thicken the resist pattern to be thickened. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-11 and 14-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Nozaki et al (US 2003/0102285 A1)

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

In his claim 1, Nozaki teaches a resist pattern thickening material comprising a resin, a crosslinking agent, and a water-soluble aromatic compound. Nozaki also states ([0045]) that his resist pattern thickening material is a water-soluble composition which contains a resin, a crosslinking agent, and a water-soluble aromatic compound and further contains a nonionic surfactant, an organic solvent, and other components as occasion demands. As to the other components, in [0086], Nozaki teaches that an amine-type quencher, an amide-type quencher, or an ammonium salt quencher can be added to his resist pattern thickening material. Therefore, the prior art teaches present inventions of claims 1-6, 10, and 14.

In his claim 10, Nozaki lists examples for his surfactant, and those examples teach present non-ionic surfactant compounds listed in present claim 7. Therefore, the prior art teaches present invention of claim 7.

In his claim 6, Nozaki teaches polyvinyl alcohol, polyvinyl acetal, and polyvinyl acetate as his resin material. Therefore, Nozaki teaches present invention of claim 8.

In his claim 8, Nozaki teaches that his crosslinking agent can be a melamine derivative, a urea derivative and an uril derivative. Therefore, the prior art teaches present invention of claim 9.

In his claim 5, Nozaki lists examples for his water-soluble aromatic compound, and those examples teach present water-soluble aromatic compounds listed in claim 11. Therefore, Nozaki teaches present invention of claim 11.

In his claim 12, Nozaki lists examples for his organic solvent, and those examples teach present organic solvents listed in present claim 15. Therefore, Nozaki teaches present invention of claim 15.

In his claims 20 and 23, Nozaki teaches a method of forming a resist pattern comprising a step for applying his resist pattern thickening material so as to cover a surface of an underlayer resist pattern after formation of the underlayer resist pattern and a step for developing the resist pattern thickening material after applying the resist pattern thickening material. Therefore, the prior art teaches present inventions of claims 16, 17, and 19. Nozaki also teaches a cycloolefin resist and a cycloolefin-maleic anhydride resist as the examples for the material of his underlayer resist pattern. Therefore, the prior art teaches present invention of claim 18.

Nozaki's claim 26 states the following;

> **26.** A method for manufacturing a semiconductor device comprising:
>
> a step for forming a resist pattern by applying a resist pattern thickening material to cover a surface of an underlayer resist pattern to thicken the underlayer resist pattern to form the resist pattern, after forming the underlayer resist pattern on an underlying layer,
>
> a step for patterning the underlying layer by performing an etching using the resist pattern formed in the step for forming the resist pattern as a mask.

Therefore, Nozaki teaches present inventions of claims 20 and 21.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nozaki et al (US 2003/0102285 A1).

As discussed above in Paragraph 4, Nozaki teaches ([0048]) examples for his resin material, which includes polyvinyl alcohol, polyvinyl acetal, polyvinyl acetate, polyacrylic acid, polyvinyl pyrolidone, polyethylene imine, polyethylene oxide, styrene-maleic acid copolymer, polyvinyl amine, polyarylamine, oxazoline group-containing water-soluble resin, water-soluble melamine resin, water-soluble urea resin, alkyd resin, and sulfonamide resin. Then, in [0049], Nozaki furthermore teaches that these resins may be used in combination. Therefore, it would have been obvious to one of ordinary skill in the art to use polyarylamine or styrene-maleic acid copolymer together with polyvinyl acetate (which is a preferred example) as Nozaki's resin materials with a

reasonable expectation of obtaining a resist pattern thickening material which efficiently thickens an underlayer resist pattern and imparts etching resistance to the surface thereof. Therefore, Nozaki's teaching would render obvious present invention of claim 12.

7. Claims 1-9 and 14-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kozawa et al (EP 1 315 043 A1).

In claims 1 and 2, Kozawa teaches a resist pattern thickening material (which is either water-soluble or an alkali-soluble) comprising a resin, a crosslinking agent, and a compound having cyclic structure. In claims 6 and 7, Kozawa teaches that the compound having cyclic structure can be an aromatic compound, an alicyclic compound, or a heterocyclic compound, and as examples for the heterocyclic compound, Kozawa lists pyrrolidine, pyridine, imidazole, oxazole, morpholine, pyrrolidone, furan pyran, saccharides and derivatives thereof. Therefore, it would have been obvious to one of ordinary skill in the art to use pyrrolidine (an amine compound) as the compound having cyclic structure in Kozawa's invention with a reasonable expectation of obtaining a resist pattern thickening material capable of forming a fine pattern with low cost. Therefore, the teachings of Kozawa render obvious present inventions of 1-4.

In claims 19 and 20, Kozawa teaches the use of a surfactant in his resist pattern thickening material which can be a non-ionic surfactant, a cationic surfactant, an anionic surfactant, or an ampholytic surfactant. It would have been obvious to one of ordinary skill in the art to use a non-ionic surfactant such as those listed in the claim 20 in

Kozawa's invention with a reasonable expectation of obtaining a resist pattern thickening material capable of forming a fine pattern with low cost. Therefore, the teachings of Kozawa render obvious present inventions of claims 5-7.

Claim 13 of Kozawa states that the resin of claim 1 is polyvinyl alcohol, polyvinyl acetal, or polyvinyl acetate. Therefore, the teachings of Kozawa render obvious present invention of claim 8.

Claim 17 of Kozawa states that the crosslinking agent of claim 1 is a melamine derivative, a urea derivative or an uril derivative. Therefore, the teachings of Kozawa render obvious present invention of claim 9.

Claims 21 and 22 of Kozawa states that his resist pattern thickening material of claim 1 further comprises an organic solvent such as those listed in claim 22. Therefore, the teachings of Kozawa render obvious present invention of claims 14 and 15.

Claims 27 and 28 of Kozawa teaches a process for forming a resist pattern comprising a step for applying a resist pattern thickening material so as to cover a surface of a resist pattern to be thickened after forming the resist pattern to be thickened and a step for developing the resist pattern thickening material after applying the resist pattern thickening material. Therefore, the teachings of Kozawa render obvious present inventions of claims 16, 17, and 19.

Claims 34-36 of Kozawa state the following:

34. A process for manufacturing a semiconductor device comprising the steps of:

forming a resist pattern by applying a resist pattern thickening material to cover a surface of a resist pattern to be thickened to thicken the resist pattern to be thickened to form the resist pattern, after forming the resist pattern to be thickened on an underlying layer; and

patterning the underlying layer by performing an etching using the resist pattern formed in the step for forming the resist pattern which is thickened as a mask,

wherein the resist pattern thickening material comprises a resin, a cross-linking agent, and a compound having a cyclic structure.

35. A process for manufacturing a semiconductor device according to claim 34, wherein the resist pattern is formed of an ArF resist.

36. A process for manufacturing a semiconductor device according to claim 35, wherein the ArF resist is one type selected at least from an acryl resist having a side-chain of an alicyclic group, a cycloolefin-maleic acid anhydride resist, and a cycloolefin resist.

37. A process for manufacturing a semiconductor device according to claim 34, further comprising:

a step for applying a non-ionic surfactant to the surface of the resist pattern to be thickened prior to the step for forming the resist pattern;

wherein the non-ionic surfactant is one selected at least from a polyoxyethylene-polyoxypropylene condensed compound, a polyoxyalkylene alkyl ether compound, a polyoxyethylene alkyl ether compound, a polyoxyethylene derivative compound, a sorbitan fatty acid ester compound, a glycerin fatty acid ester compound, a primary alcohol ethoxylate compound, and a phenol ethoxylate compound.

* * * * *

Therefore, Kozawa's teachings render obvious present inventions of claims 18, 20, and 21.

8. Claims 1-9 and 14-21 are provisionally rejected under 35 U.S.C. 103(a) as being obvious over copending Application No. 10/305,258 which has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the copending application, it would constitute prior art under 35 U.S.C. 102(e) if published or patented. This provisional rejection under 35 U.S.C. 103(a) is based upon a presumption of future publication or patenting of the conflicting application.

In claims 1 and 2, App.'258 teaches a resist pattern thickening material (which is either water-soluble or an alkali-soluble) comprising a resin, a crosslinking agent, and a compound having cyclic structure. In claims 6 and 7, App.'258 teaches that the compound having cyclic structure can be an aromatic compound, an alicyclic compound, or a heterocyclic compound, and as examples for the heterocyclic compound, App.'258 lists pyrrolidine, pyridine, imidazole, oxazole, morpholine,

pyrrolidone, furan pyran, saccharides and derivatives thereof. Therefore, it would have been obvious to one of ordinary skill in the art to use pyrrolidine (an amine compound) as the compound having cyclic structure with a reasonable expectation of obtaining a resist pattern thickening material capable of forming a fine pattern with low cost. Therefore, the teachings of App.'258 render obvious present inventions of 1-4.

In claims 19 and 20, App.'258 teaches the use of a surfactant in its resist pattern thickening material which can be a non-ionic surfactant, a cationic surfactant, an anionic surfactant, or an ampholytic surfactant. It would have been obvious to one of ordinary skill in the art to use a non-ionic surfactant such as those listed in the claim 20 with a reasonable expectation of obtaining a resist pattern thickening material capable of forming a fine pattern with low cost. Therefore, the teachings of App.'258 render obvious present inventions of claims 5-7.

Claim 13 of App.'258 states that the resin of claim 1 is polyvinyl alcohol, polyvinyl acetal, or polyvinyl acetate. Therefore, the teachings of App.'258 render obvious present invention of claim 8.

Claim 17 of App.'258 states that the crosslinking agent of claim 1 is a melamine derivative, a urea derivative or an uril derivative. Therefore, the teachings of App.'258 render obvious present invention of claim 9.

Claims 21 and 22 of App.'258 states that the resist pattern thickening material of claim 1 further comprises an organic solvent such as those listed in claim 22. Therefore, the teachings of App.'258 render obvious present invention of claims 14 and 15.

Claims 27 and 28 of App.'258 teaches a process for forming a resist pattern comprising a step for applying a resist pattern thickening material so as to cover a surface of a resist pattern to be thickened after forming the resist pattern to be thickened and a step for developing the resist pattern thickening material after applying the resist pattern thickening material. Therefore, the teachings of App.'258 render obvious present inventions of claims 16, 17, and 19.

Claims 34-36 of App.'258 state the following:

> **34.** A process for manufacturing a semiconductor device comprising the steps of:
>
> forming a resist pattern by applying a resist pattern thickening material to cover a surface of a resist pattern to be thickened to thicken the resist pattern to be thickened to form the resist pattern, after forming the resist pattern to be thickened on an underlying layer; and
>
> patterning the underlying layer by performing an etching using the resist pattern formed in the step for forming the resist pattern which is thickened as a mask,
>
> wherein the resist pattern thickening material comprises a resin, a cross-linking agent, and a compound having a cyclic structure.
>
> **35.** A process for manufacturing a semiconductor device according to claim 34, wherein the resist pattern is formed of an ArF resist.
>
> **36.** A process for manufacturing a semiconductor device according to claim 35, wherein the ArF resist is one type selected at least from an acryl resist having a side-chain of an alicyclic group, a cycloolefin-maleic acid anhydride resist, and a cycloolefin resist.
>
> **37.** A process for manufacturing a semiconductor device according to claim 34, further comprising:
>
> a step for applying a non-ionic surfactant to the surface of the resist pattern to be thickened prior to the step for forming the resist pattern;
>
> wherein the non-ionic surfactant is one selected at least from a polyoxyethylene-polyoxypropylene condensed compound, a polyoxyalkylene alkyl ether compound, a polyoxyethylene alkyl ether compound, a polyoxyethylene derivative compound, a sorbitan fatty acid ester compound, a glycerin fatty acid ester compound, a primary alcohol ethoxylate compound, and a phenol ethoxylate compound.
>
> * * * * *

Therefore, App.'258 renders obvious present inventions of claims 18, 20, and 21.

This provisional rejection might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the copending application was derived from the inventor of this application and is thus not the invention "by another," or by a showing of a date of invention for the instant application prior to the effective U.S. filing date of the copending application under 37 CFR 1.131. For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the

subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1-9 and 14-21 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, 6, 7, 13, 17-22, 27, 28, 34-36 of copending Application No. 10/305,258. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

In claims 1 and 2, App.'258 teaches a resist pattern thickening material (which is either water-soluble or an alkali-soluble) comprising a resin, a crosslinking agent, and a compound having cyclic structure. In claims 6 and 7, App.'258 teaches that the compound having cyclic structure can be an aromatic compound, an alicyclic compound, or a heterocyclic compound, and as examples for the heterocyclic

compound, App.'258 lists pyrrolidine, pyridine, imidazole, oxazole, morpholine, pyrrolidone, furan pyran, saccharides and derivatives thereof. Therefore, it would have been obvious to one of ordinary skill in the art to use pyrrolidine (an amine compound) as the compound having cyclic structure with a reasonable expectation of obtaining a resist pattern thickening material. Therefore, the teachings of App.'258 render obvious present inventions of 1-4.

In claims 19 and 20, App.'258 teaches the use of a surfactant in its resist pattern thickening material which can be a non-ionic surfactant, a cationic surfactant, an anionic surfactant, or an ampholytic surfactant. It would have been obvious to one of ordinary skill in the art to use a non-ionic surfactant such as those listed in the claim 20 with a reasonable expectation of obtaining a resist pattern thickening material. Therefore, the teachings of App.'258 render obvious present inventions of claims 5-7.

Claim 13 of App.'258 states that the resin of claim 1 is polyvinyl alcohol, polyvinyl acetal, or polyvinyl acetate. Therefore, the teachings of App.'258 render obvious present invention of claim 8.

Claim 17 of App.'258 states that the crosslinking agent of claim 1 is a melamine derivative, a urea derivative or a uril derivative. Therefore, the teachings of App.'258 render obvious present invention of claim 9.

Claims 21 and 22 of App.'258 states that the resist pattern thickening material of claim 1 further comprises an organic solvent such as those listed in claim 22. Therefore, the teachings of App.'258 render obvious present invention of claims 14 and 15.

Claims 27 and 28 of App.'258 teaches a process for forming a resist pattern comprising a step for applying a resist pattern thickening material so as to cover a surface of a resist pattern to be thickened after forming the resist pattern to be thickened and a step for developing the resist pattern thickening material after applying the resist pattern thickening material. Therefore, the teachings of App.'258 render obvious present inventions of claims 16, 17, and 19.

Claims 34-36 of App.'258 state the following:

> **34.** A process for manufacturing a semiconductor device comprising the steps of:
>
> forming a resist pattern by applying a resist pattern thickening material to cover a surface of a resist pattern to be thickened to thicken the resist pattern to be thickened to form the resist pattern, after forming the resist pattern to be thickened on an underlying layer; and
>
> patterning the underlying layer by performing an etching using the resist pattern formed in the step for forming the resist pattern which is thickened as a mask,
>
> wherein the resist pattern thickening material comprises a resin, a cross-linking agent, and a compound having a cyclic structure.
>
> **35.** A process for manufacturing a semiconductor device according to claim 34, wherein the resist pattern is formed of an ArF resist.
>
> **36.** A process for manufacturing a semiconductor device according to claim 35, wherein the ArF resist is one type selected at least from an acryl resist having a side-chain of an alicyclic group, a cycloolefin-maleic acid anhydride resist, and a cycloolefin resist.
>
> **37.** A process for manufacturing a semiconductor device according to claim 34, further comprising:
>
> a step for applying a non-ionic surfactant to the surface of the resist pattern to be thickened prior to the step for forming the resist pattern;
>
> wherein the non-ionic surfactant is one selected at least from a polyoxyethylene-polyoxypropylene condensed compound, a polyoxyalkylene alkyl ether compound, a polyoxyethylene alkyl ether compound, a polyoxyethylene derivative compound, a sorbitan fatty acid ester compound, a glycerin fatty acid ester compound, a primary alcohol ethoxylate compound, and a phenol ethoxylate compound.
>
> * * * * *

Therefore, App.'258 renders obvious present inventions of claims 18, 20, and 21.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Allowable Subject Matter

11. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. None of the cited prior arts teaches or suggests

the present resin of claim 13 which is at least one of a polyvinyl aryl acetal resin, a polyvinyl aryl ether resin, and a polyvinyl aryl ester resin.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F. Huff, can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. J. L.

S. Lee
May 28, 2004

Sin J. Lee

Sin J. Lee
Patent Examiner
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